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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/620,776	07/21/2000	Daniel F. DiFonzo	283014-00019	3993

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EXAMINER

D AGOSTA, STEPHEN M

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 09/620,776	<b>Applicant(s)</b> DIFONZO ET AL.	
	<b>Examiner</b> Stephen M. D'Agosta	<b>Art Unit</b> 2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
    If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
    a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
    1. ☐ Certified copies of the priority documents have been received.  
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
    \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
    a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-4, 6-16, 18-21 and 23-33** rejected under 35 U.S.C. 102(b) as being anticipated by Natarajan et al. U.S. Patent 5,790,070 (hereafter referred to as Natarajan).

As per **claims 1, 12, 18 and 29**, Natarajan teaches a satellite/wireless communication network (abstract) comprising:

A plurality of satellites (eg. nodes), each having at least one dynamically directionally controllable communications link (C1, L40-46)

A network controller for dynamically changing the direction of the controllable communications links of the nodes to enable transmission of signals between nodes (figure 2, #42 in space and #52 on ground)

With reference to claim 18, Natarajan teaches a satellite system (eg. hubs) having at least one dynamically directionally controlled communications link and a plurality of subscriber units (eg. remote nodes) [figure 1 and 2 show the satellite(s) and subscriber nodes].

As per **claims 2 and 19**, Natarajan teaches claim 1 wherein the controllable links comprise one of:

An electronically steerable narrow antenna beam and a switchable antenna beam (C3, L39-45)

As per **claims 3 and 20**, Natarajan teaches claim 1 wherein selected ones of the nodes further include an additional dynamically controllable communications link (figure 2 shows satellite #20 with multiple antennas #26 which is interpreted as additional links. Also, link #29 can be a multiplexed circuit containing multiple links as well).

As per **claims 4, 13, 21 and 30**, Natarajan teaches claim 1 further comprising a low data rate signaling channel for transmitting control information from the network controller to the nodes (C6, L35-40 – schedule/control information is sent from the satellite to the subscriber units).

As per **claims 6, 14, 23 and 31**, Natarajan teaches claim 1 wherein the controller controls the directions of the controllable communication links according to an assignment table (figure 6) that maps time slots (figure 3 shows slots for subscriber units: SU(1), SU(2), etc.) to node pairs (C5, L53-67 to C6, L1-50 details how the subscriber units requiring a link are assigned time slots for coverage).

As per **claims 7, 15, 24 and 32**, Natarajan teaches claim 1 wherein the controller changes direction of the links during a guard interval between the transmission/reception of information signals between pairs of nodes (C5, L1-20 discusses subscriber requests being translated into time intervals and C6, L25-30 details taking into account interference and/or antenna imposed constraints).

As per **claims 8 and 25**, Natarajan teaches claim 1 wherein each node includes an antenna producing at least one dynamically directionally controllable beam (figure 2, #26 shows the satellite with multiple steerable antennas).

As per **claims 9 and 26**, Natarajan teaches claim 8 wherein each of the controllable beams is a narrow beam (C3, L37-45).

As per **claims 10, 16, 17 and 33**, Natarajan teaches claim 1 and means for connecting one of said nodes to a backbone circuit (figure 1 shows Control Station #22 connecting to the PSTN #34 as does figure 2).

As per **claims 11 and 28**, Natarajan teaches claim 1 wherein at least one node is a satellit and at least one other node is a ground station (figure 1 and 2 depict this scenario).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 5 and 22** rejected under 35 U.S.C. 103(a) as being unpatentable over Natarajan in view of Elson et al. U.S. Patent 6,317,100 (hereafter referred to as Elson).

As per **claims 5 and 22**, Natarajan teaches claim 5 **but is silent on** wherein the signaling channel includes a wide-angle antenna beam at each of the nodes

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Natarajan does teach that each antenna can project its beam over several microcells C4, L35-36 AND one skilled in the art would provide narrow and/or wide angle antenna beams.

Elson teaches an antenna system adapted to provide antenna beams having various characteristics whereby the antenna system is adapted to provide wide antenna beams (on the forward link) [ABSTRACT]. One skilled in the art would provide wide-angle antenna beams on each/every node.

It would have been obvious to one skilled in the art at the time of the invention to modify Natarajan, such that the signaling channel includes a wide-angle antenna beam at each of the nodes, to provide to allow uniform radiation of signals throughout a desired area (such as a sector or cell).

**Claims 17 and 34** rejected under 35 U.S.C. 103(a) as being unpatentable over Natarajan in view of Hughes et al. GB2330734A (hereafter referred to as Hughes).

As per **claims 17 and 34**, Natarajan teaches claim 12 **but is silent on** comprising dynamically spreading the communication signal over multiple routes among the nodes and reassembling the signal at a predetermined node.

One skilled in the art realizes that satellite-to-satellite communication to connect two user around the world is known (eg. satellite crosslinks and/or multiple uplink/downlink hops are required to navigate the globe).

One skilled in the art also realizes that packet communications provides "spreading a signal over multiple routes among the nodes and reassembling the signal at a predetermined node (eg. similar to TCP/IP).

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Hughes teaches routing signals through a wireless communication system comprising a network of linked nodes (title) whereby information is routed/hopped from node to node until it reaches its destination node. Information may be sent on different paths or may be split between two (or more) paths (abstract).

It would have been obvious to one skilled in the art at the time of the invention to modify Natarajan, such that it can dynamically spread the communication signal/message over multiple routes among the nodes and reassembling the signal/message at a predetermined node, to take advantage of the efficiencies of packet data communications.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

1. Kurby et al. U.S. Patent 5,559,806 teaches steerable antenna.
2. Waifan et al. U.S. Patent 6,032,041 teaches wideband communications
3. Willars U.S. Patent 5,953,325 teaches steerable distributed antennas
4. Gans et al. U.S. Patent 5,610,617 teaches beam selectivity
5. Bruckert U.S. Patent 5,596,333 teaches communication signal.
6. Sauvageot et al. U.S. Patent 6,128,488 teaches non-GEO satellite.
7. Eguchi U.S. Patent 5,537,122 teaches tracking antenna array.
8. Fay U.S. Patent 5,128,687 teaches aperture antenna with beams.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Hunter can be reached on 703-308-6732. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

SMD  
October 8, 2002

  
DANIEL HUNTER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600